Diamond Scrap Yard
Waukegan, Lake County
0971905176
ILO001093509
SF / HRS

Site Team Evaluation Prioritization

9/14/99

CERCLA Report

Illinois Environmental Protection Agency

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1. INTRODUCTION

On September 30, 1998 the Illinois Environmental Protection Agency's (ILEPA) CERCLA Site Assessment Program was tasked by the U.S. Environmental Protection Agency (USEPA) to conduct an Site Team Evaluation Prioritization of Diamond Scrap Yard. The site is located in an urban area on the east side of Waukegan Illinois, near the shoreline of Lake Michigan.

The site was initially placed on the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) on June 24, 1994. A CERCLA Integrated Assessment (IA) was conducted by the ILEPA in October 1994. This STEP investigation is designed to supplement the 1994 investigation.

2. SITE BACKGROUND

2.1 SITE DESCRIPTION

The Diamond Scrap Yard property is approximately 12 acres in size and is located in the east-central portion of Waukegan Township, in Lake County, Illinois, in Sections 21 and 28 of Township 45 North, Range 12 East of the Third Principal Meridian. Several parcels of land which are arranged into a long narrow strip of land constitute the property under investigation. This property can be found between Market Street and the Elgin, Joliet and Evanston (EJ& E) Railroad. (Figure 3)

Diamond Scrap Yard site is located on the east side of Market Street, with EJ& E Railroad to the

east, East Water Street to the north, and South Street to the south. One discontinuous parcel is located northeast of the corner of Market and East Water Streets. The entire facility is estimated at approximately 3000 feet along the north-south axis and less than 250 feet wide along the east-west axis. Topography of the property is generally flat with no visual route of surface water drainage except the area in the immediate vicinity of the Waukegan River.

Diamond Scrap Yard is located in an area which consisted of industrial, commercial, and residential properties. Neighboring properties are mainly manufacturing facilities, undeveloped land, vacant buildings, railroad properties, and residences. The Waukegan Warehouse was previously located near the southern portion of the Diamond Scrap property. A USX Steel plant is located approximately one quarter mile south of the facility. The Great Lakes Naval Training Center is located south of the USX Steel plant. Residences are located toward the southwest end of the facility, west of Market Street. A recently constructed highway (Sheridan Road) is located west of Market Street and the Metra rail line lies beyond the residences and east of Sheridan Road.

As recently as 1992, eight buildings were located on the site. During a previous investigation by WESTON, some of the vacant buildings in the southern portion of the site were used by local and\or transient populations for shelter and wire burning operations. However, the only building present during the 1994 site reconnaissance was the Nelson Machine Shop, located in the northern most portion of the site in Block 28. This building is an approximately 6,500 square feet, single story, metal framed and sided structure on a concrete slab. Previously, this structure

contained a machine shop and is currently occupied by Northern Marine.

During the 1994 CERCLA investigation, large amounts of surficial debris were observed on the portion of the property south of where the main scrap yard was located. Materials encountered include broken glass, large piles of scrap metal, crushed drums, a large old wooden boat and numerous miscellaneous items. Along Market Street there were appliances and trash. A sign, "Warning No Dumping Violators will be prosecuted", was posted on the property. Remaining portions of a chain link fence were still intact around the perimeter of the property although large sections were missing and holes were cut in the existing portions.

The southern portion of the property was more heavily vegetated with ground vegetation and large deciduous trees. Areas north of the large deciduous trees had sparse ground vegetation with exposed soil.

2.2 SITE HISTORY

Historically, Diamond Scrap Yard operations were initiated sometime in the 1930's. The entire property had been owned and operated by the Diamond Scrap Yard (Diamond) as a scrap metal reclamation facility. The center most portion of the property is believed to be the location of the oldest part of the Diamond operations, with parcels to the north and south being purchased later. Portions of the site were owned by several other entities prior to the scrap yard operations. The former uses of these parcels reportedly included other scrap yard operations, automobile and drum scrapping, wire\transformer burning, bulk petroleum and coal storage, and iron and steel

production. A brief description of the prior owners and operators of the various blocks of the site is provided below. The Northern portion of the site above Water Street is currently in Trust through the Grand National Bank. The southern portion (south of Water Street) is in Trust through the Bank of Waukegan.

Historical site information was obtained primarily from interviews conducted by WESTON INC. with Mr. Burton Diamond. The parcels that comprise the Diamond Scrap Yard are described below and Figure 3 shows their location.

Block 28

This block was previously owned by Nelson Machine Shop. Diamond purchased the parcel in 1971.

Block 29

This block was formerly Kimmel Iron and Metal, which was in operation since 1922. Sometime in the late 1920's, Kimmel reportedly built a dike on the Waukegan River which flowed through his property. The area to the west of the dike was backfilled at this time. The Waukegan River currently flows through a culvert under this parcel's northern section. Diamond purchased this property in 1959. A portion of the southwest corner of this block is not owned by Diamond.

Block 1

This block was formerly owned by City Auto Parts, an auto salvage junkyard operation. This section was purchased by Diamond in 1979.

Block 42

The southern section of this block was formerly the Hadelman Junkyard. Also, an unnamed coal

company reportedly operated in this area during this time. Mr. Diamond's grandfather purchased this property in the 1940's.

Block 9

The northern section of this block was owned by Sinclair Oil and operated as an aboveground bulk storage tank farm. The purchase date by Diamond is unknown.

Block 10-A

The northwest section of this block is currently owned by Slater's BBQ restaurant, and was never part of the Diamond Facility. The middle section of this block formerly housed the Globe Department Store, which later became the Durkin Warehouse. The nature of this operation and the date of purchase by Diamond is unknown.

Blocks 2 and 19

No former owner\operators of significance were reported during historical investigations or conversations with Mr. Diamond, regarding either block.

2.3 APPLICABILITY OF OTHER STATUES

Due to the nature of the recycling operation, Diamond Scrap Yard was not subject to RCRA corrective action activities. The site was also not subject to regulation under jurisdiction of: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Atomic Energy Act (AEA), Uranium Mill Tailing Radiation Control Act (UMTRCA).

3. SITE INSPECTION ACTIVITIES AND ANALYTICAL RESULTS

3.1 SITE REPRESENTATIVE INTERVIEW

Prior to the CERCLA sampling event a number of telephone interviews were conducted with Joe DiCello of the Grand National Bank, and Mr. Fred Abdula with the Bank of Waukegan. The interviews were conducted to gather information on past and present activities at the site. An explanation of the CERCLA Site Assessment process and sampling plans occurred at that time. Both parties declined the opportunity to collect split samples during the STEP Inspection sampling event. They both offered their full cooperation during the investigation.

3.2 RECONNAISSANCE INSPECTION

A reconnaissance inspection was conducted in March, 1999 by the ILEPA. This site visit consisted of a visual inspection to locate potential areas of concern and establish a sampling plan. Health and safety concerns were noted during the reconnaissance in order to insure that the field sampling team was properly equipped to perform sample collection activities.

The waste piles were removed by the City of Waukegan. A four to six foot high earthen berm has been placed around the perimeter of the site by the City to prevent further dumping. Fist sized and smaller wastes in the form of plastics, glass and metal shards still remain on site.

All of the former structures are gone. All that remains are the foundation slabs. One foundation has a basement with evidence of transients living within the basement area.

3.3 SOIL/SEDIMENT AND GROUNDWATER SAMPLING

The 1994 IA investigation indicated elevated levels of lead (up to 5970 ppm), PCBs (up to 28000 ppb), and dioxins (up tp 1320 ppt, 2378-TCDD) in the surface soils. The highest concentrations were found in the center and southern end of the site. Elevated levels of lead (up to 302 ppm) and PCBs (up to 63 ppb) were detected in the sediment along the Waukegan River.

Eleven soil, five sediment and six Geoprobe groundwater samples were collected during the April 1999 STEP sampling event. The samples were collected to determine if surficial contaminants still exist and if they have impacted the groundwater beneath the site or the Waukegan River which discharges into Lake Michigan.

All soil, sediment and groundwater samples were analyzed for compounds on the Target Compound List. The Target Compound List (TCL) is provided in Appendix B of this report. Table 1 gives the description of each sample and Figures 4 - 7 show their locations.

Soil Sampling

Seven soil samples were collected from cores collected during Geoprobe operations. The remaining four soil samples were collected from the surface. The sub-surface samples were used to identify the potential migration of contaminants into the groundwater. Figures 4 - 7 identify the sample locations.

Sediment Sampling

Five sediment samples were collected from the Waukegan River which flows through the north end of the Diamond Scrap property toward Lake Michigan. Figure 4 illustrates the approximate location of each sediment sample in relation to the scrap yard property. Each sample was collected with downstream samples collected first and upstream samples last. The sediments were collected in mid-river wherever possible. The purpose of collecting sediment samples was to document whether hazardous contaminants have impacted the surface water pathway.

Groundwater Sampling

Six groundwater samples were collected from the Diamond Scrap Yard. The samples were collected from Geoprobe boreholes utilizing a peristaltic pump. The water table was found around seven feet, and the samples were collected at a depth of seven to eleven feet. Sample G106 was not collected due to insufficient water recovery.

3.4 ANALYTICAL RESULTS

Tables 2 - 5 contain an analytical summary of soil, sediment and groundwater sample results. The complete laboratory analytical data of Diamond Scrap Yard are provided in Appendix D of this report. Contaminant concentrations that exceed established benchmarks or guidelines are considered as potentially threatening to human health and/or the environment.

Elevated levels of volatiles, semivolatiles, PCBs and inorganics were found in the soil samples. Benzene, benzo(a)pyrene, PCBs and lead were detected in the near surface soil samples at

concentrations exceeding USEPA Superfund Chemical Data Matrix (SCDM) benchmarks. PCB concentrations up to 4231 ppb were detected. Lead concentrations were found in concentrations up to 3630 ppm.

Sediment samples collected from the Waukegan River contained PCBs, copper, lead and zinc. PCB concentrations were up to 259 ppb, and lead concentrations reached 497 ppm. These concentrations are above USEPA Sediment Screening Benchmarks. Two sources of benchmarks were used for this comparison: Ontario sediment quality guidelines and USEPA ecotoxological (ecotox) thresholds. Ontario sediment quality guidelines are non-regulatory ecological benchmark values that serve as indicators of potential aquatic impacts. Levels of contaminants below Ontario benchmarks indicate a level of pollution which has no effect on the majority of the sediment-dwelling organisms. Contaminants for which no Ontario benchmarks were available were compared to USEPA ecotox thresholds. Ecotox thresholds are ecological benchmarks above which there is sufficient concern regarding adverse ecological effects to warrant further site investigation. Ecotox thresholds are to be used for screening purposes and are not regulatory criteria, site-specific cleanup standards or remediation goals.

Groundwater samples from the Geoprobe boreholes contained inorganic contaminants. Sample G104 collected from just south of Water Street contained lead at concentrations (967 ppb) exceeding SCDM benchmarks. There are no volatile, semivolatile or pesticide/PCB analytical data available for the groundwater samples due to the exceedance of Laboratory Holding Times. Additional groundwater samples will have to be collected to determine organic contaminants

have impacted the groundwater.

4. IDENTIFICATION OF SOURCES

Diamond Scrap Yard operations have occurred for over 40 years on the parcel of land east of Market Street. On-site operations have included salvaging and scrapping old automobiles, transformers, drums, in addition to other unknown materials. Reports of dumping liquids from gasoline tanks before crushing automobiles and drums may have contributed to contaminant soil on the property.

The 1994 CERCLA Integrated Assessment (IA) investigation identified an area of soil contamination calculated as 522,720 square feet. On-site soils sampled during the inspection revealed contamination within the upper two feet of soil. Lead, PCBs and dioxins are the contaminants of concern.

The 1999 STEP investigation has indicated that lead has leached into the groundwater at the northern end of the site. Observations made during the site visit revealed the lack of any groundwater or surface water containment in place. No evidence of a liner was noted nor did any of the soil borings suggest a natural or man-made liner. Surface water near the north end of the site flowed into the Waukegan River without any obstruction.

5. MIGRATION PATHWAYS

5.1 GROUNDWATER

Information provided by the Illinois State Geological Survey (ISGS) indicates the geology of the area consists of glacial deposits ranging from approximately 90 feet on the east side of the county to 300 feet on the west side. Beach deposits are present as glacial drift under the site and along the shoreline of Lake Michigan. Underlying the glacial drift, is a layer of bedrock formation consisting mainly of beds of dolomite and shale which dip easterly at about 10 to 15 feet per mile (ISWS/BUL 60-20/76). This layer of dolomite is known as Silurian dolomite which is hydraulically connected to the glacial drift. Thickness of the shallow dolomite ranges from nearly zero on the west side of the county to 200 feet on the east side. Depth of the dolomite layer is approximately 90 to 300 feet from surface elevations.

The interconnected glacial drift material and the Silurian dolomite is the aquifer of concern at this site. The top of the aquifer of concern is approximately seven feet below ground surface. The Silurian dolomite is underlain by the Maquoketa Group which a non-water- bearing shale (a confining layer) that separates the dolomite layer from deeper water bearing layers. Beneath the shale layer is (Galena-Platteville) dolomite and (Glenwood-St. Peter) sandstone. Wells drilled through the Maquoketa shale would probably not be susceptible to contamination since this geologic unit would act to restrict the downward migration of groundwater or contaminants. Shallow groundwater flow at this property towards the Waukegan River and Lake Michigan.

Groundwater from six Geoprobe boreholes were collected during the 1999 sampling event.

Inorganic contaminants were found at levels above background concentrations. Lead was detected at location G104 at 967 ppb, which is above CERCLA SCDM benchmarks. Organic analysis was not available due to the exceedance of laboratory holding times. Additional samples will be required to fill in the data gap.

The majority of the population within four miles of Diamond Scrap are served by the Waukegan Water System using Lake Michigan as a drinking water supply. However, twelve private wells have been identified within a four mile radius of the site. Based on information obtained from U.S.G.S. topographic maps and the U.S. Census average of 2.97 persons per house in Lake County, an estimated 36 people use groundwater from private water supplies within four miles of Diamond Scrap Yard. The nearest known private drinking water well drawing from the aquifer of concern was located approximately 3.5 miles south of the site under investigation. Approximately 60 non-community public drinking water wells (restaurants, parks, gas stations, ect.) exist within four miles of the site. The total number of workers at these establishments is unknown. None of these wells are believed to be endangered by site contaminants due to their up gradient distance from the site.

Four public drinking water wells were identified west of the site, the nearest being approximately 2.8 miles (Appendix A). These four wells are currently inactive and are considered standby wells to be used in emergencies. The depth of these wells range from approximately 600 to 1200 feet below ground surface. These are the only known public water wells within a four mile radius of the site. No private or public water wells were sampled since the nearest well is over 2 miles

from the site.

5.2 SURFACE WATER

Surface water runoff from the northern portion of the Diamond Scrap property enters the Waukegan River. A large culvert, located beneath the area where the Diamond Scrap Yard Office once existed, allows the Waukegan River to flow beneath the property approximately 250 feet east into Lake Michigan.

The watershed of the Waukegan River consists of the city of Waukegan and storm water drains which collect water from the city's storm sewer system. An average stream flow rate was not listed in the U.S. Geological Survey Water Data Report 1989, although the River had a low flow rate estimated at less than 10 cubic feet per second (cfs) during the field inspection. According to the Illinois State Water Survey there are no surface water drinking intakes between the Probable Point of Entry (PPE) and Lake Michigan.

Lake Michigan is used for a drinking water source, recreational purposes and fishing. Information from the IEPA Bureau of Public Water Supplies, U.S.G.S. topographic maps and from local water operators indicate that nine communities have surface water intakes within the 15 mile target distance.

Information provided to the agency by the Illinois Department of Natural Resources (IDNR) documented two state threatened species of fish within the 15 mile surface water route.

According to IDNR there are no sensitive environments within a half mile radius of the Diamond Scrap property. An area referred to as Julians Reef, located approximately 12 miles south of Diamond Scrap, was designated as a potential spawning area critical for maintenance of fish\shellfish. Julians Reef has been identified as a particular area important to the maintenance of unique biotic communities.

One additional area identified by IDNR is Illinois Beach State Park, located approximately 2.5 miles north of Diamond Scrap Property. IDNR referred to this State Park as possibly being the densest concentration of endangered and threatened species in the state of Illinois. However, it should be pointed out that species are not found within the surface water route but rather all are terrestrial occurrences within the park. There are also Lacustrine wetlands along Lake Michigan's shoreline, according to the National Wetland Inventory prepared by the U.S. Department of Interior. The Federal Emergency Management Flood Insurance Maps lists the Diamond Scrap property in an "area of minimal flooding."

No surface water samples were collected during the CERCLA STEP investigation. Five sediment samples were collected from the Waukegan River which flows through a culvert beneath the northern portion of the property, where the Diamond Scrap office was previously located. Sediment sample X201 was collected upstream, west, of the Diamond property. The remaining sediment samples X202 through X205 were collected downstream, east, of the Diamond Scrap property. Samples X203, X204 and X205 contained the highest levels of inorganic constituents when compared to background conditions. The inorganic contaminants found in this sample

included: antimony, barium, copper, lead, nickel, and zinc. Copper , lead and zinc exceeded USEPA Sediment Screening Guidelines Ecotox Thresholds. Ecotox Thresholds are ecological benchmarks that are media-specific contaminant concentrations above which there is sufficient concern regarding adverse ecological effects to warrant further site investigation. Ecotox Thresholds are to be used for screening purposes and are not regulatory criteria, site-specific cleanup standards or remediation goals. The contaminants found in the sediments document a release of contamination into the Waukegan River.

5.3 SOIL EXPOSURE

During the 1999 CERCLA STEP inspection eleven soil samples were collected from the scrap yard property. Sample X101 was collected west of the scrap yard property, alongside of Market Street, and was intended to establish background concentration information. According to the Lake County Soil Survey, the Diamond Scrap property and the location of X101 was classified as "Made Land" or fill. Analytical results from samples collected on Diamond property revealed lead levels above the USEPA SCDM benchmarks.

Within a four mile radius of Diamond Scrap Yard property, the population is estimated to be approximately 146,102 people. The nearest residences are located across from Market Street at the southern end of the site. Slater's BBQ restaurant is located within the Diamond Scrap Yard strip. This parcel was never owned by Diamond. No salvage activities were believed to have occurred there. No schools or day care facilities were found to exist on-site or within 200 feet of potentially contaminated areas. Nearby population within one mile of Diamond Scrap property

has been calculated to be 15,155 people.

Access to the site was partially restricted by fencing in the area south of Water Street and north of the river. The rest of the site had a four to six foot high earthen berm around the road access ways. No access restrictions existed along the railroad or to the south of the site.

During the sampling event evidence of indigents were observed on the Diamond Scrap property. In addition, alcohol containers and fire pits indicate this property might be used for limited recreation. According to the Illinois Department of Conservation Records, no sensitive areas were identified within one-half mile of the scrap yard property.

5.4 AIR PATHWAY

No ambient air samples were collected, nor were any air releases observed visually during the field inspection. The potential does exist for contaminants to be carried away from the site due to contaminants found in surficial soil. Surficial soil was observed throughout the site during sample collection. A minimal amount of ground vegetation found in the areas where most of the salvaging activities occurred would allow windblown particles to be dispersed from the site.

5.0 ADDITION RISK BASED OBJECTIVES

This section provides an evaluation which compares data generated during STEP activities with additional analytical benchmarks. These benchmarks compare soil, sediment, and/or groundwater data with specific risk based criteria. The objectives discussed in this section have not been used to assess the site for Hazard Ranking Systems (HRS) purposes.

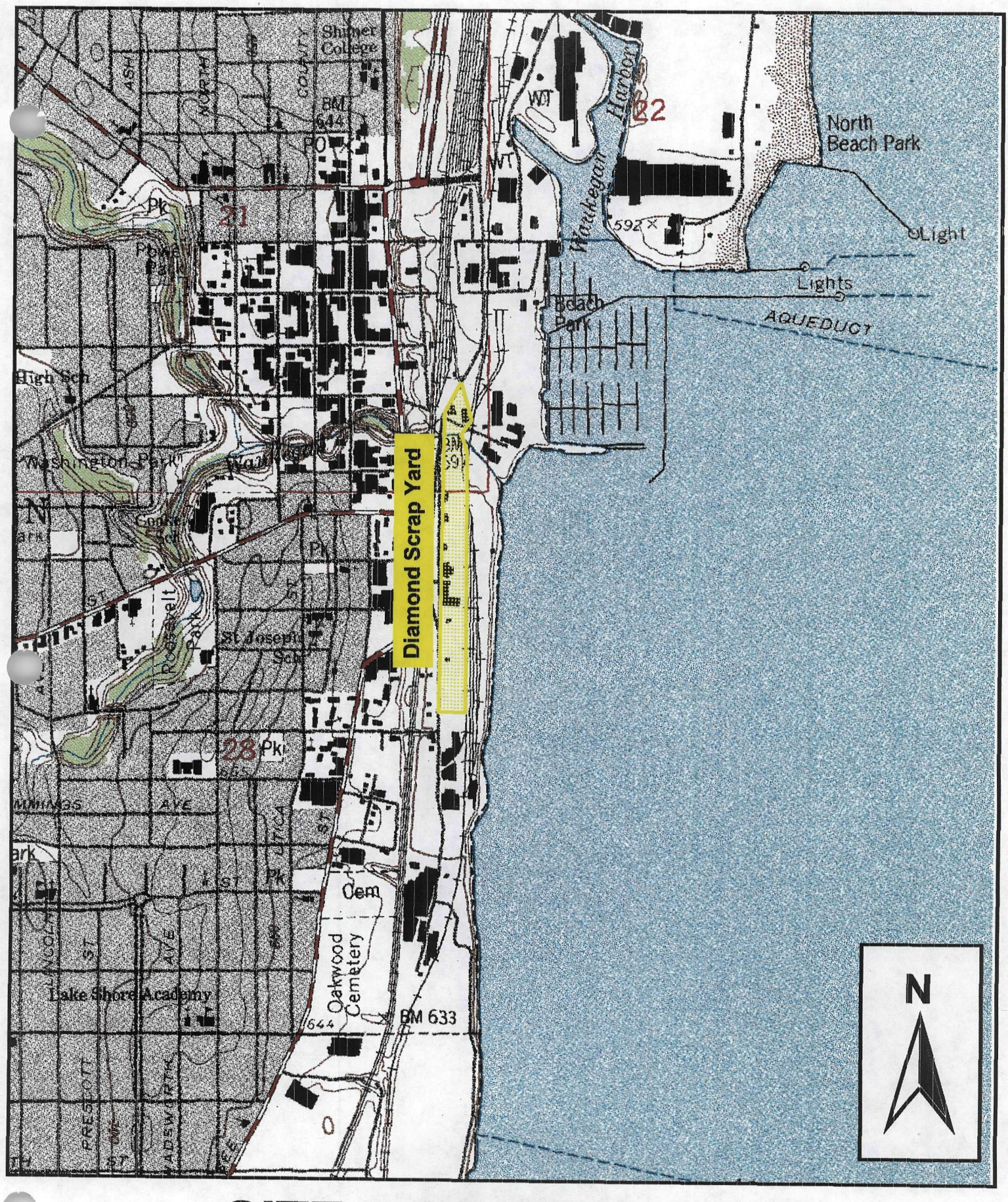
The Illinois EPA's TACO guidance document (35 IL Adm. Code Part 742), can be used to develop site specific remediation objectives for sites being addressed under the Illinois Site Remediation Program. This document discusses key elements required to develop risk-based remediation objectives for sites being addressed under the Illinois Site Remediation Program. This document discusses key elements required to develop risk-based remediation objectives, how background values may be used, and provides guidance through three tiers of the risk-based approach. The Illinois EPA uses this guidance, and the groundwater standards established in 36 IL Adm. Code 620, to determine soil and groundwater remediation objectives. Based on the TACO definition of Class I and Class II groundwater, groundwater beneath the Diamond Scrap Yard is considered as Class II above the ten foot depth and Class I below ten feet.

Groundwater contaminants found during the April 1999, CERCLA investigation have been compared to the Tier 1 Groundwater Remediation Objectives for the Direct Ingestion of Groundwater Portion of the Groundwater Ingestion Route. Lead exceeded TACO Tier I cleanup objectives at G104. No other groundwater contaminants exceeded TACO objectives.

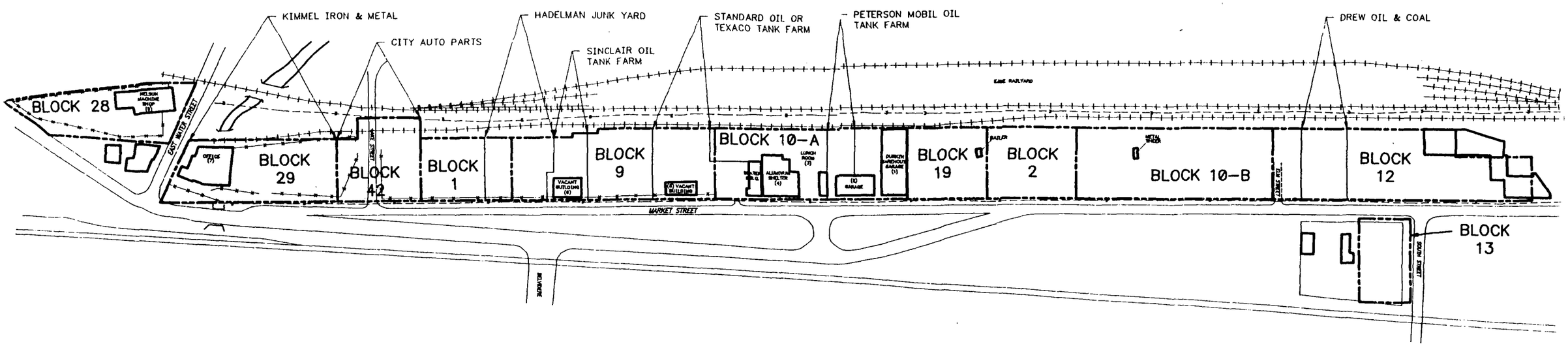
Near surface soil samples X105 - X108 all had contaminants that exceeded TACO Industrial/Commercial cleanup objectives. The contaminants were benzene, benzo(a)pyrene, PCBs and lead. The contaminants were found in the near surface depths, but not at the 7 foot depth. Further investigation will be required to determine the full vertical and horizontal extent of the contamination.

Lead, copper, zinc and PCBs were found at levels above the IEPA Office of Chemical Safety's derived screening benchmarks, based on Evaluation of Illinois Sieved Stream Sediment Data, 1982 - 1995. The river and Lake Michigan shoreline are considered fisheries.

STATE LOCATION MAP



SITE LOCATION MAP

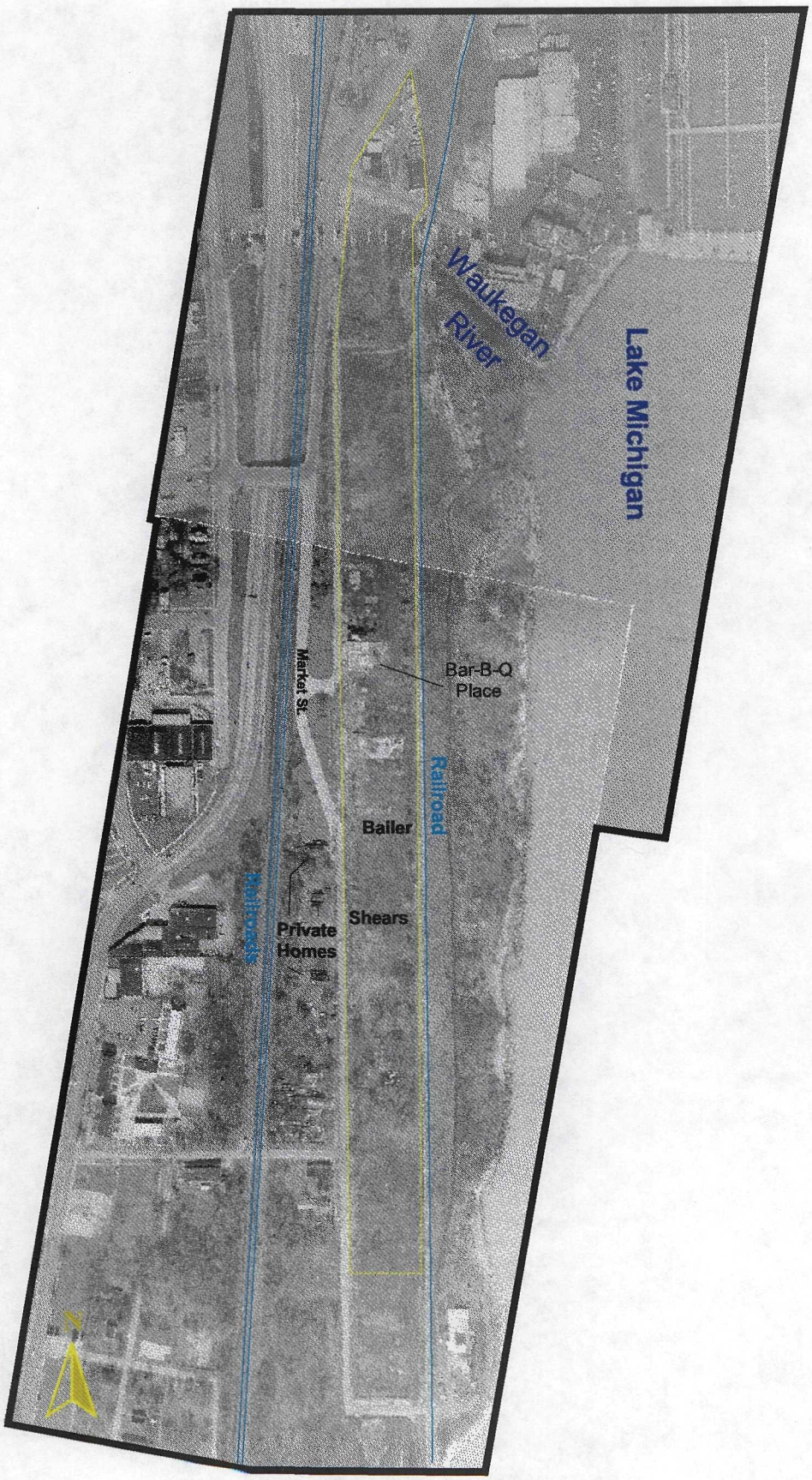


0' 200'

HISTORIC BLOCK LAYOUT

OF

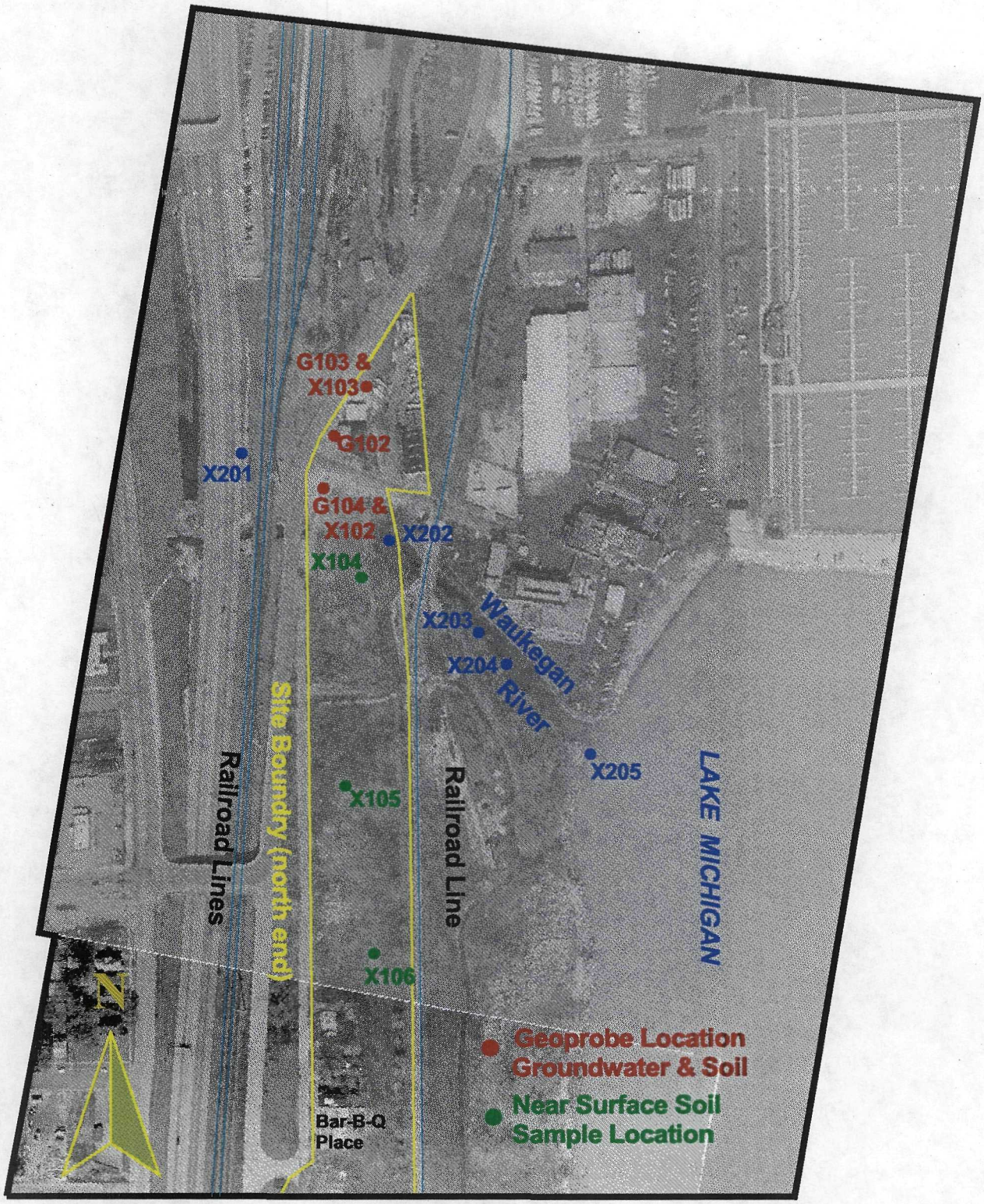
DIAMOND SCRAP YARD



600 0 600 1200

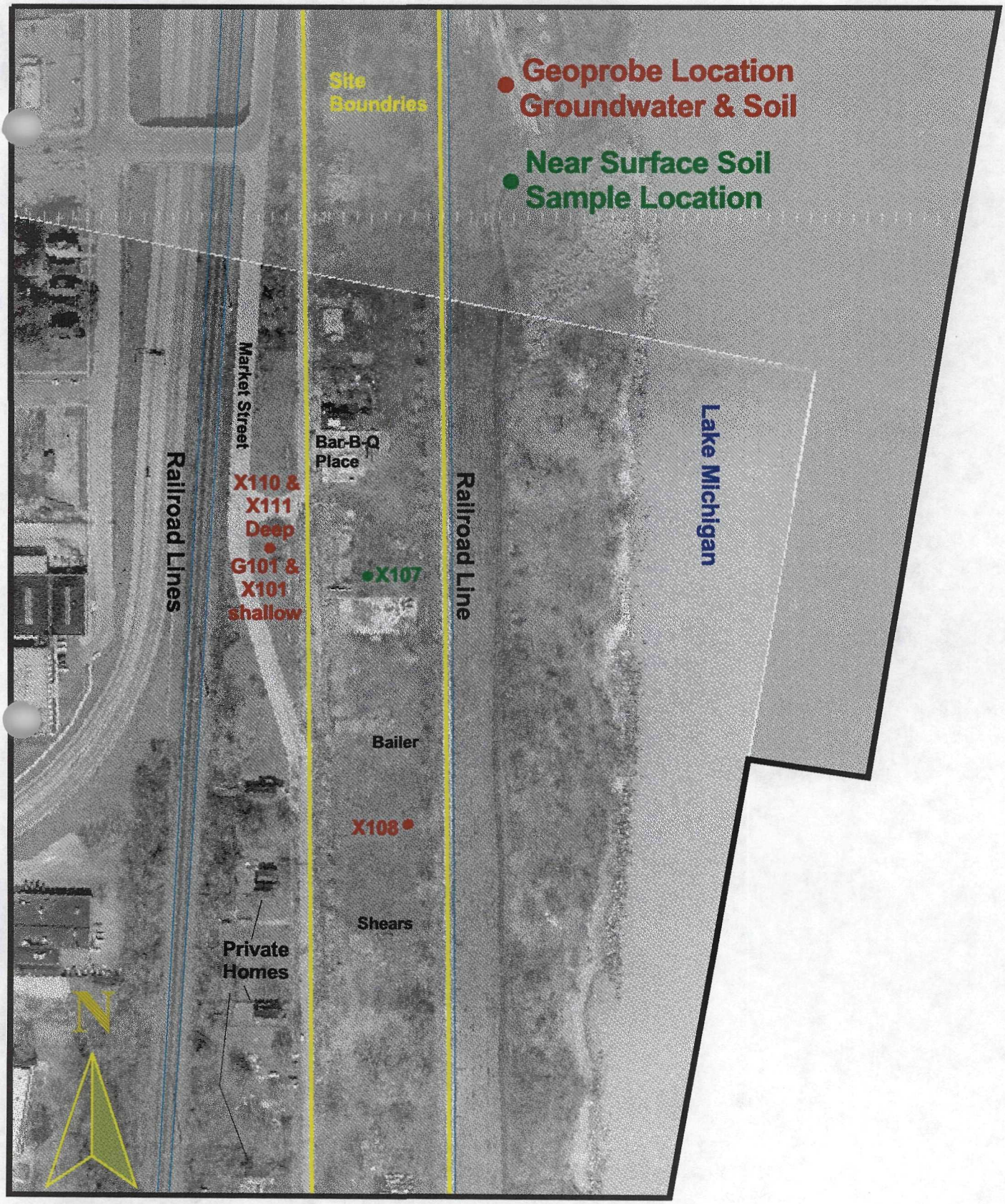
Feet

SITE LAYOUT MAP



SAMPLE LOCATION MAP

Diamond Scrap - North End



SAMPLE LOCATION MAP

Diamond Scrap - Central & South End

SAMPLE LOCATION MAP

Diamond Scrap - Southern end

SAMPLE DESCRIPTIONS & LOCATIONS

SOIL & GROUNDWATER SAMPLES

SAMPLE	DEPTH	WATER TABLE	SCREEN DEPTH	APPEARANCE	LOCATION	JUSTIFICATION
G101 & X101 X110 & X111	0 - 2" 6.5' - 7'	7'	7' - 11'	Brown sand to 11' then gravel	Halfway down west side of site in small grassway adjacent to site	Background sample Deep background soil sample
G102	6.5' to 7.5'	7'	7' - 11'	Brown sand to 11' then gravel	In southwest corner of Old Feed Mill portion of site on west side of building	Characterize groundwater in north end
G103 & X103	6.5' to 7.5'	7.5'	7' - 11'	Brown sand to 11' then gravel Strong diesel odor	At north corner of Old Feed Mill portion of site 130' west of parking lot on-site	Characterize groundwater in north end Characterize site soils
G104 & X102	6.5' to 7.5'	7'	7' - 11'	Brown sand w/ gravel & debris Clay below 11'	In northwest corner of main portion of site - along intersection of Water St. & Market St.	Characterize groundwater in north end Characterize site soils
X104	0 - 2"			Gritty black soil w/ oily appearance	In north central section of Block 29	Characterize site soils
X105	0 - 2"			Black oily soil w/ debris	In center of Block 1	Characterize site soils
X106	0 - 2"			Gritty black soil w/ oily appearance	In southern end of Block 9 North of BBQ restaurant	Characterize site soils
X107	0 - 2"			Gritty black soil w/ oily appearance	Between Block 10-A and Block 19 South of BBQ restaurant	Characterize site soils
X108 (no GndH2O)	6.5' to 7.5'	Not Found	Not Collected	Debris & fill to 7', black sand w/ odor from 7' to 11', clay below 11'	In Block 2 between Bailer & Shears	Characterize site soils
G105 & X109	6.5' to 7.5'	7'	7' - 11'	Black sand to 11' then clay	In north end of Block 12, north of tree line	Characterize groundwater in north end Characterize site soils

SEDIMENT SAMPLES

SAMPLE	DEPTH of Water	SEDIMENT Depth			
X201	12"	0" - 6"	Brown sand w/ gravel	Under Sheridan Road Overpass	Background
X202	2'	0" - 6"	Brown sand w/ gravel	Between Railroad overpass & Culvert under site	Characterize sediments
X203	2.5'	0" - 6"	Brown sand w/ gravel	East of railroad overpass in center channel	Characterize sediments
X204	6"	0" - 6"	Brown sand w/ gravel	Approximately half way from railroad bridge to mouth of river	Characterize sediments
X205	12"	0" - 6"	Brown sand w/ gravel	At mouth of river on south side of channel	Characterize sediments

ORGANIC SOIL SAMPLE SUMMARY

Sample Location ID	*TACO	X 101	X 102	X 103	X 104	X 105	X 106	X107	X108	X109	X110	X111	Superfund
Lab Organic Sample ID	SOIL	EBWB7	EBWB8	EBWB9	EBWC0	EBWC1	EBWC2	EBWC3	EBWC4	EBWC5	EBWC6	EBWC7	Chemical
Lab Inorganic Sample ID	Cleanup	MEBFH1	MEBFH2	MEBFH3	MEBFH4	MEBFH5	MEBFH6	MEBFH7	MEBFH8	MEBFH9	MEBFJ0	MEBFJ1	Data Matrix
Description	Objectives	Background									Duplicates		Benchmarks
	(ppb)												(ppb)
VOLATILES (ppb)													
Chloromethane	---	10 U	--	--	--	--	22	7 J	--	--	--	--	45000
Bromomethane	3900	10 U	--	--	--	--	22	--	--	--	--	--	820000
1,1,1-Trichloroethane	1200000	10 U	--	--	--	--	--	17	--	--	--	--	
Benzene	1500	2 J	12	--	--	--	--	13	**1600**	--	--	--	20000
Toluene	42000	4 J	14	--	--	--	--	--	3600	--	--	--	120000000
Ethylbenzene	58000	1 J	--	37 J	--	--	--	--	4900	--	--	--	58000000
Xylene(total)	410000	3 J	9	--	--	--	--	--	22000	--	--	--	1200000000
SEMIVOLATILES (ppb)													
Naphthalene	8200000	420 U	--	15000 J	--	--	160	--	50 J	--	--	--	
2-Methylnaphthalene		420 U	--	70000 J	--	--	160	--	67 J	--	--	--	
Phenanthrene		310 J	--	15000	--	3900	2200	--	--	--	--	--	
Anthracene	610000000	52 J	--	--	--	980 J	390 J	--	--	--	--	--	170000000
Fluoranthene	82000000	610	--	--	--	--	1700	--	--	--	--	--	
Pyrene		540	--	2600	--	--	3100 J	--	--	--	--	--	17000000
Butylbenzylphthalate	930000	360 J	--	--	--	4300 J	1200 J	--	--	--	--	--	120000000
Benzo(a)anthracene	8000	290 J	--	--	--	3000 J	1100 J	--	--	--	--	--	
Chrysene	780000	380 J	--	--	--	3600 J	1200 J	--	--	--	--	--	
bis(2-Ethylhexyl)phthalate	410000	190 J	--	--	--	6200 J	--	2500 J	--	--	--	--	42000
Benzo(b)fluoranthene	8000	330 J	--	--	--	4300 J	1000 J	--	--	--	--	--	23000000
Benzo(k)fluoranthene	78000	320 J	--	--	--	2300 J	1000 J	--	--	--	--	--	
Benzo(a)pyrene	800	330 J	--	--	--	**3000** J	**830** J	--	--	--	--	--	80
Indeno(1,2,3-cd)pyrene	8000	230 J	--	--	--	1400 J	530 J	--	--	--	--	--	
Benzo(g,h,i)perylene		260 J	--	--	--	1800 J	--	--	--	--	--	--	
PESTICIDES (ppb)													
Endosulfan sulfate		18 J	--	--	--	--	94 J	91 J	--	--	--	--	
Endrin aldehyde		24	--	--	--	--	110 J	98 J	--	--	--	--	
gamma-Chlorodane	4000	2.2 J	--	--	--	--	53 J	47 J	--	--	--	--	
Aroclor-1016	1000	210 U	--	--	--	--	**855** J	**829** J	--	**704**	--	--	76
Aroclor-1248	1000	210 U	--	--	--	--		**2736** J	--	**785**	--	--	76
Aroclor-1254	1000	507 J	--	--	--	**1311** J	**4231** J	**2933** J	--	--	--	--	76
Aroclor-1260	1000	536	--	--	--	**1048** J	**2453** J	**1643** J	--	--	--	--	76

* Cleanup Objectives were derived from the IEPA's "Tiered Approach to Corrective Action Objectives Guidance Document" (TACO).
The objectives were taken from Appendix B: Table B for Industrial/Commercial Properties and is based on Class I Groundwater.

U Indicates an undetected contaminant. Value identifies equipment detection limit.

J Indicates an estimated concentration.

B Indicates Concentration is below CRDL but above IDL.

Concentrations that appear in red have exceeded the SCDM or TACO cleanup objectives.

INORGANIC SOIL SAMPLE SUMMARY

Sample Location ID	*TACO	X 101	X 102	X 103	X 104	X 105	X 106	X107	X108	X109	X110	X111	Superfund
Lab Organic Sample ID	SOIL	EBWB7	EBWB8	EBWB9	EBWC0	EBWC1	EBWC2	EBWC3	EBWC4	EBWC5	EBWC6	EBWC7	Chemical
Lab Inorganic Sample ID	Cleanup	MEBFH1	MEBFH2	MEBFH3	MEBFH4	MEBFH5	MEBFH6	MEBFH7	MEBFH8	MEBFH9	MEBFJ0	MEBFJ1	Data Matrix
Description	Objectives	Background									Duplicates		Benchmarks
	(ppm)												(ppm)
INORGANICS (ppm)													
Aluminum	--	6820	--	--	--	--	25800	142000	--	--	--	--	--
Antimony	82	1.2 U	--	--	--	8.2 B	8.7 B	69.1	9.6 B	--	--	--	230
Barium	14000	105	--	--	--	--	--	616	327	--	--	--	41000
Beryllium	1	0.56 B	--	--	--	--	--	7.3	--	--	--	--	0
Cadmium	200	2.1	--	--	--	6.50	7.1	66.4	15.8	--	--	--	290
Chromium	420	20.4	--	--	--	--	168	377	--	--	--	--	2900
Copper	8200	107	--	--	--	403	1320	40700	654	--	--	--	
Lead	400	230	--	--	--	**834**	**760**	**3630**	--	--	--	--	
Mercury	610	0.48	--	--	--	1.8	2.9	2.1	--	--	--	--	170
Nickel	4100	22.5	--	--	--	71.2	191	372	--	--	--	--	12000
Selenium	1000	0.74 U	--	--	--	--	147	10.6	--	--	--	--	2900
Silver	1000	0.49 U	--	--	--	--	--	28	--	--	--	--	2900
Zinc	61000	326	--	--	--	2070	1220	11100	1180	--	--	--	170000

* Cleanup Objectives were derived from the IEPA's "Tiered Approach to Corrective Action Objectives Guidance Document" (TACO).
The objectives were taken from Appendix B: Table B for Industrial/Commercial Properties and is based on Class I Groundwater.

U Indicates an undetected contaminant. Value identifies equipment detection limit.

J Indicates an estimated concentration.

B Indicates Concentration is below CRDL but above IDL.

Concentrations that appear in red have exceeded the SCDM or TACO cleanup objectives.

GROUNDWATER SAMPLE SUMMARY

Sample Location ID	*TACO	G101	G102	G103	G104	G105	G106	Superfund
Lab Organic Sample ID	Groundwater	EBDX2	EBDX3	EBDX4	EBWB1	EBWB2	EBWB3	Chemical
Lab Inorganic Sample ID	Cleanup	MEAMY1	MEAMY2	MEAMY3	MEBFB1	MEBFB2	MEBFB3	Data Matrix
Description	Objectives	Background						Benchmarks
Depth	(ppb)							(ppb)
VOLATILES (ppb)								
Ethylbenzene	700	---	---	28	---	---	---	700
Xylene(total)	10000	---	---	23	---	---	---	10000
INORGANICS (ppb)								
Aluminum	---	331	316	118 B	11100	254	INSUFFICIENT	---
Barium	2	65 B	5.9 B	387	383	163 B		2000
Beryllium	4	1 U	---	---	2.8 B	---	WATER	4
Cadmium	5	1 U	---	---	4.3 B	---		5
Chromium	100	2.3 B	---	---	33.3	5.1 B	RECOVERY	100
Copper	650	5.9 B	---	7.8 B	106	21.7 B		1300
Lead	7.5	2.4 B	---	---	**967**	6.7	For	15
Mercury	2	0.1 U	---	0.54	0.3	---		2
Nickel	100	5.7 B	1.6 B	1.1 B	33 B	12.3 B	G106	100
Zinc	5000	21.7	13.1 B	26.9	1500	39.6		11000

* Cleanup Objectives were derived from the IEPA's "Tiered Approach to Corrective Action Objectives Guidance Document" (TACO).
The objectives were taken from Appendix B: Table B for Industrial/Commercial Properties and is based on Class I Groundwater.

J Indicates an estimated concentration

B Indicates Concentration is below CRDL but above IDL

Concentrations that appear in red have exceeded the SCDM & TACO cleanup objectives.

SEDIMENT SAMPLE SUMMARY

Sample Location ID	*IEPA	X 201	X202	X 203	X204	X 205	USEPA
Lab Organic Sample ID	SOIL	EBWC8	EBWC9	EBWDO	EBWD1	EBWD2	Sediment
Lab Inorganic Sample ID	Cleanup	MEBFJ2	MEBFJ3	MEBFJ4	MEBFJ5	MEBFJ6	Screening
Description	Objectives	Background					Benchmarks
	(ppb)						(ppb)
VOLATILES (ppb)							
Acetone	---	13	16	45	14	13	---
TICs		10	10	10	10	9	
SEMIVOLATILE (ppb) TICS		17	6	7	19	14	
PCBs (ppb)							
Aroclor-1254	20	39 U	---	---	**259** J	---	23
Aroclor-1260	20	39 U	---	---	**183** J	---	23
INORGANICS (ppm)	(ppm)						(ppm)
Antimony	---	1.9	---	13.4	6.6	---	---
Barium	---	16.6	---	109	---	---	---
Beryllium	---	1.3	---	4.9	4.3	---	---
Copper	38	**87.1** J	---	**3320** J	**739** J	**304** J	34
Lead	28	**56.9**	---	**355**	**497**	**153**	47
Nickel	---	12.3	---	47.8	36	---	21
Zinc	80	**942**	---	**3750**	**3420**	---	150

* IEPA Sediment Cleanup Objectives derived by IEPA Office of Chemical Safety From: Evaluation of Illinois Sieved Stream Sediment Data. 1982 - 1995. IE

USEPA *Sediment Screening ECOTOX Thresholds*

TICs are Tentatively Identified Compounds

U Indicates an undetected contaminant. Value identifies equipment detection limit.

J Indicates an estimated concentration.

Concentrations that appear in red have exceeded the USEPA or TACO cleanup objectives.

APPENDIX A

Sample Photos

SITE NAME: Diamond Scrap Yard
SITE ILB: 001093509 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1000
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 1
SAMPLE: G102
DIRECTION: N
COMMENTS: Photo taken toward
north on west side of "Old Feed
Mill" portion of site.

DATE: 4/14/99
TIME: 1000
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 2
SAMPLE: G102
DIRECTION: E
COMMENTS: Photo taken toward
east showing base of Old Feed
Mill in background.

SITE NAME: Diamond Scrap Yard
SITE ILB: 001093509 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1045
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 3
SAMPLE: X201
DIRECTION: NW
COMMENTS: Photo taken toward
the north from south side of
Waukegan River at mouth.

DATE: 4/14/99
TIME: 1045
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 4
SAMPLE: X201
DIRECTION: NW
COMMENTS: Photo taken toward
the northwest along south side of
Waukegan River at mouth.

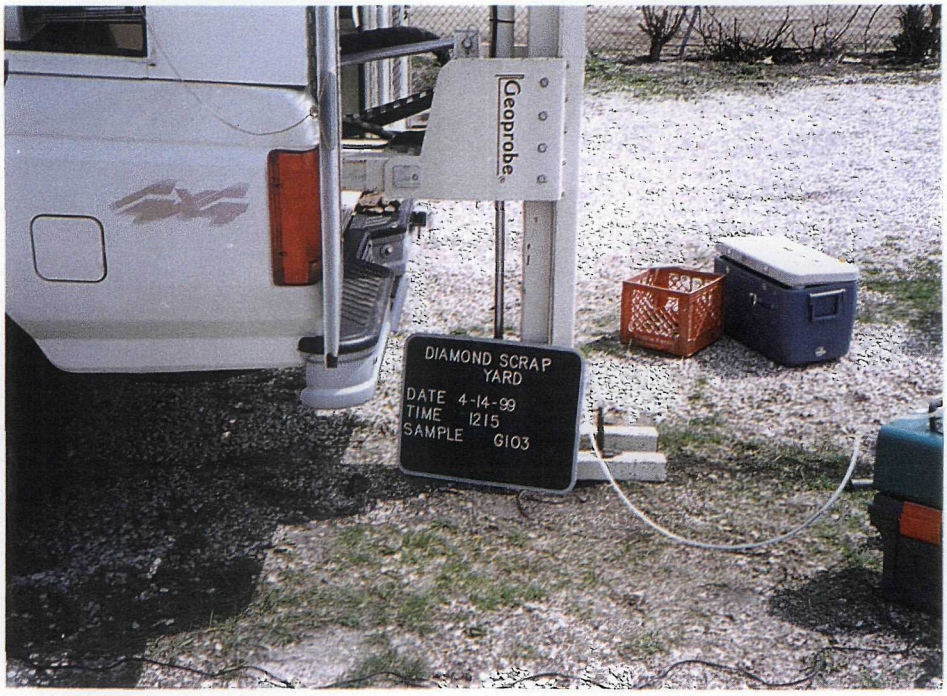
SITE NAME: Diamond Scrap Yard
SITE ILB: 001093509 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1100
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 5
SAMPLE: X204
DIRECTION: E
COMMENTS: Photo taken toward
east showing mouth of river in
background.
Only one photo taken.

DATE: 4/14/99
TIME: 1215
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 6
SAMPLE: G103 & X103
DIRECTION: W
COMMENTS: Photo taken toward
west at north end of Old Feed
Mill portion. Waukegan downtown
area is in background.
Groundwater and soil samples
were collected from this location.

SITE NAME: Diamond Scrap Yard
SITE ILB: 001093509 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1245
PHOTO BY: Ted Prescott
ROLL / PHOTO : photo 7
SAMPLE: G103 & X103
DIRECTION: E
COMMENTS: Photo taken toward
east at north end of Old Feed Mill.
Groundwater & soil samples were
collected at this location.



DATE: 4/14/99
TIME: 1415
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 8
SAMPLE: X203
DIRECTION: N
COMMENTS: Photo taken toward
north bank of Waukegan River.
Only one photo taken.

SITE NAME: Diamond Scrap Yard
SITE ILD: 001093509 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1440
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 9
SAMPLE: X202
DIRECTION: NW
COMMENTS: Photo taken toward
northwest at east side of eastern
most bridge.
Only one photo taken.

DATE: 4/14/99
TIME: 1600
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 10
SAMPLE: X201
DIRECTION: N
COMMENTS: Photo taken toward
north west of RR bridge - west of
site.
Only one photo taken.

SITE NAME: Diamond Scrap Yard
SITE ILD: 00000021 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1645
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 11
SAMPLE: X104
DIRECTION: N
COMMENTS: Photo taken toward
north near north end of site & on
south - Water Street side of site.

DATE: 4/14/99
TIME: 1645
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 12
SAMPLE: X104
DIRECTION: E
COMMENTS:
See photo # 11

SITE NAME: Diamond Scrap Yard
SITE ILB: 001093509 **COUNTY:** Lake

DATE: 4/14/99
TIME: 1630
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 13
SAMPLE: X102 & G104
DIRECTION: S
COMMENTS: Photo taken toward
the south in northern end of
main site.

DATE: 4/14/99
TIME: 1630
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 14
SAMPLE: X102 & G104
DIRECTION: W
COMMENTS:
See above description.

SITE NAME: Diamond Scrap Yard
SITE ILD: 001093509 **COUNTY:** Lake

DATE: 4/15/99
TIME: 915
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 15
SAMPLE: X105
DIRECTION: NE
COMMENTS: Photo taken
toward Lake Michigan & adjacent
RR property.
NOTE: Time should be 0900 on
Photo

DATE: 4/15/99
TIME: 900
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 16
SAMPLE: X105
DIRECTION: N
COMMENTS: Photo taken toward
north end of site. Old Feed Mill is
in top - center of photo.
NOTE: Time should be 0900 on
Photo

SITE NAME: Diamond Scrap Yard
SITE ILD: 001093509 **COUNTY:** Lake

DATE: 4/15/99
TIME: 915
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 17
SAMPLE: X106
DIRECTION: E
COMMENTS: Photo taken toward
adjacent RR property & Lake
Michigan.
NOTE: Sample # should be
X106

DATE: 4/15/99
TIME: 915
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 17
SAMPLE: X106
DIRECTION: N
COMMENTS: Photo taken toward
north. Old Feed Mill is in top
center of photo.
NOTE: Sample # should be
X106

SITE NAME: Diamond Scrap Yard
SITE ILD: 001093509 **COUNTY:** Lake

DATE: 4/15/99
TIME: 945
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 19
SAMPLE: X107
DIRECTION: W
COMMENTS: Photo taken toward
BBQ restaurant.

DATE: 4/15/99
TIME: 945
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 19
SAMPLE: X107
DIRECTION: N
COMMENTS: Photo taken toward
north.

SITE NAME: Diamond Scrap Yard
SITE ILD: 001093509 **COUNTY:** Lake

DATE: 4/15/99
TIME: 930
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 21
SAMPLE: X108
DIRECTION: S
COMMENTS: Photo taken toward
south of site.

DATE: 4/15/99
TIME: 930
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 22
SAMPLE: X108
DIRECTION: E
COMMENTS: Photo taken toward
Lake Michigan.

SITE NAME: Diamond Scrap Yard
SITE ILD: 001093509 **COUNTY:** Lake

DATE: 4/15/99
TIME: 1030
PHOTO BY: Ted Prescott
ROLL / PHOTO: photo 23
SAMPLE: X109 & G105
DIRECTION: E
COMMENTS: Photo taken toward
adjacent RR property and
Lake Michigan.

DATE:
TIME:
PHOTO BY:
ROLL / PHOTO:
SAMPLE:
DIRECTION:
COMMENTS:

APPENDIX B

Target Compound List

TARGET COMPOUND LIST

Volatile Target Compounds

Chloromethane	1,2-Dichloropropane
Bromomethane	cis-1,3-Dichloropropene
Vinyl Chlorde	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride	1,1,2-Trichloroethane
Acetone	Benzene
Carbon Disulfide	trans-1,3-Dichloropropene
1,1-Dichloroethene	Bromoform
1,1-Dichloroethane	4-Methyl-2-pentanone
1,2-Dichloroehtene (total)	2-Hexanone
Chloroform	Tetrachloroethene
1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
2-Butanone	Toluene
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride	Ethylbenzene
Vinyl Acetate	Styrene
Bromodichloromethane	Xylenes (total)

Base/Neutral Target Compounds

Hexachloroethane	2,4-Dinitrotoluene
bis(2-Chloroethyl) Ether	Diethylphthalate
Benzyl Alcohol	N-Nitrosodiphenylamine
bis (2-Chloroisopropyl) Ether	Hexachlorobenzene
N-Nitroso-Di-n-Propylamine	Phenanthrene
Nitrobenzene	4-Bromophenyl-phenylether
Hexachlorobutadiene	Anthracene

2-Methylnaphthalene	Di-n-Butylphthalate
1,2,4-Trichlorobenzene	Fluoranthene
Isophorone	Pyrene
Naphthalene	Butylbenzylphthalate
4-Chloroaniline	bis(2-Ethylhexyl)Phthalate
bis(2-chloroethoxy)Methane	Chrysene
Hexachlorocyclopentadiene	Benzo(a)Anthracene
2-Chloronaphthalene	3-3'-Dichlorobenzidene
2-Nitroaniline	Di-n-Octyl Phthalate
Acenaphthylene	Benzo(b)Fluoranthene
3-Nitroaniline	Benzo(k)Fluoranthene
Acenaphthene	Benzo(a)Pyrene
Dibenzofuran	Ideno(1,2,3-cd)Pyrene
Dimethyl Phthalate	Dibenz(a,h)Anthracene
2,6-Dinitrotoluene	Benzo(g,h,i)Perylene
Fluorene	1,2-Dichlorobenzene
4-Nitroaniline	1,3-Dichlorobenzene
4-Chlorophenyl-phenylether	1,4-Dichlorobenzene

Acid Target Compounds

Benzoic Acid	2,4,6-Trichlorophenol
Phenol	2,4,5-Trichlorophenol
2-Chlorophenol	4-Chloro-3-methylphenol
2-Nitrophenol	2,4-Dinitrophenol
2-Methylphenol	2-Methyl-4,6-dinitrophenol
2,4-Dimethylphenol	Pentachlorophenol
4-Methylphenol	4-Nitrophenol
2,4-Dichlorophenol	

Pesticide/PCB Target Compounds

alpha-BHC	Endrin Ketone
beta-BHC	Endosulfan Sulfate
delta-BHC	Methoxychlor
gamma-BHC (Lindane)	alpha-Chlordane
Heptachlor	gamma-Chlordane
Aldrin	Toxaphene
Heptachlor epoxide	Aroclor-1016
Endosulfan I	Aroclor-1221
4,4'-DDE	Aroclor-1232
Dieldrin	Aroclor-1242
Endrin	Aroclor-1248
4,4'-DDD	Aroclor-1254
Endosulfan II	Aroclor-1260
4,4'-DDT	

Inorganic Target Compounds

Aluminum	Manganese
Antimony	Mercury
Arsenic	Nickel
Barium	Potassium
Beryllium	Selenium
Cadmium	Silver
Calcium	Sodium
Chromium	Thallium
Cobolt	Vanadium
Copper	Zinc
Iron	Cyanide
Lead	Sulfide
Magnesium	

DATA QUALIFIERS

QUALIFIER	DEFINITION ORGANICS	DEFINITION INORGANICS
U	Compound was tested for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL is also multiplied by two, to account for the fact that only half of the extract is recovered.	Analyte was analyzed for but not detected.
J	Estimated value. Used when estimating a concentration for tentatively identified compounds (TICS) where a 1:1 response is assumed or when the mass spectral data indicate the presence of a compound that meets the identification criteria and the result is less than the sample quantitation limit but greater than zero. Used in data validation when the quality control data indicate that a value may not be accurate.	Estimated value. Used in data validation when the quality control data indicate that a value may not be accurate.
C	This flag applies to pesticide results where the identification is confirmed by GC/MS.	Method qualifier indicates analysis by the Manual Spectrophotometric method.
B	Analyte was found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.	The reported value is less than the CRDL but greater than the instrument detection limit (IDL).
D	Identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor as in the "E" flag, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values are flagged with the "D" flag.	Not used.
E	Identifies compounds whose concentrations exceed the calibration range for that specific analysis. All extracts containing compounds exceeding the calibration range must be diluted and analyzed again. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses must be reported on separate Forms I. The Form I for the diluted sample must have the "DL" suffix appended to the sample number.	The reported value is estimated because of the presence of interference.
A	This flag indicates that a TIC is a suspected aldol concentration product formed by the reaction of the solvents used to process the sample in the laboratory.	Method qualifier indicates analysis by Flame Atomic Absorption (AA).
M	Not used.	Duplicate injection (a QC parameter not met).

N	Not used	Spiked sample (a QC parameter not met).
S	Not used.	The reported value was determined by the Method of Standard Additions (MSA).
W	Not used.	Post digestion spike for Furnace AA analysis (a QC parameter) is out of control limits of 85% to 115% recovery, while sample absorbance is less than 50% of spike absorbance.
*	Not used.	Duplicate analysis (a QC parameter not within control limits).
+	Not used.	Correlation coefficient for MSA (a QC parameter) is less than 0.995.
P	Not used.	Method qualifier indicates analysis by ICP (Inductively Coupled Plasma) Spectroscopy.
CV	Not used.	Method qualifier indicates analysis by Cold Vapor AA.
AV	Not used.	Method qualifier indicates analysis by Automated Cold Vapor AA.
AS	Not used.	Method qualifier indicates analysis by Semi-Automated Cold Spectrophotometry.
T	Not used.	Method qualifier indicates Titrimetric analysis.
NR	The analyte was not required to be analyzed.	The analyte was not required to be analyzed.
R	Rejected data. The QC parameters indicate that the data is not usable for any purpose.	Rejected data. The QC parameters indicate that the data is not usable for any purpose.

APPENDIX C

Excerpts from TACO

"Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual (Part A)", Interim Final, EPA Publication No. EPA/540/1-89/002, (December 1989).

"Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment Interim Guidance", Draft, (August 18, 1992).

"Soil Screening Guidance: Technical Background Document", EPA Publication No. EPA/540/R-95/128, PB96-963502 (May 1996).

"Soil Screening Guidance: User's Guide", EPA Publication No. EPA/540/R-96/018, PB96-963505 (April 1996).

"Superfund Exposure Assessment Manual", EPA Publication No. EPA/540/1-88/001, (April 1988).

RCRA Facility Investigation Guidance, Interim Final, developed by USEPA (EPA 530/SW-89-031), 4 volumes, May 1989.

b) CFR (Code of Federal Regulations). Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (202) 783-3238:

40 CFR 761.120 (1993).

c) This Section incorporates no later editions or amendments.

Section 742.215 Determination of Soil Attenuation Capacity

a) The concentrations of organic contaminants of concern remaining in the soil shall not exceed the attenuation capacity of the soil, as determined under subsection (b) of this Section.

b) The soil attenuation capacity is not exceeded if:

1) The sum of the organic contaminant residual concentrations analyzed for the purposes of the remediation program for which the analysis is

performed, at each discrete sampling point, is less than the natural organic carbon fraction of the soil. If the information relative to the concentration of other organic contaminants is available, such information shall be included in the sum. The natural organic carbon fraction (foc) shall be either:

A) A default value of 6000 mg/kg for soils within the top meter and 2000 mg/kg for soils below one meter of the surface; or

B) A site-specific value as measured by ASTM D2974-87, Nelson and Sommers, or by SW-846 Method 9060, as incorporated by reference in Section 742.210.

2) The total petroleum hydrocarbon concentration is less than the natural organic carbon fraction of the soil as demonstrated using a method approved by the Agency. The method selected shall be appropriate for the contaminants of concern to be addressed; or

3) Another method, approved by the Agency, shows that the soil attenuation capacity is not exceeded.

Section 742.220 Determination of Soil Saturation Limit

a) For any organic contaminant that has a melting point below 30^0C, the remediation objective for the inhalation exposure route developed under Tier 2 or Tier 3 shall not exceed the soil saturation limit, as determined under subsection (c) of this Section.

b) For any organic contaminant, the remediation objective under Tier 2 or Tier 3 for the migration to groundwater portion of the groundwater ingestion exposure route shall not exceed the soil saturation limit, as determined under subsection (c) of this Section.

c) The soil saturation limit shall be:

1) The value listed in Appendix A, Table A for that specific contaminant;

2) A value derived from Equation S29 in Appendix C, Table A; or

3) A value derived from another method approved by the Agency.

Section 742.225 Determination of Compliance with Remediation Objectives

a) Compliance with groundwater remediation objectives developed under Subparts D through F and H through I shall be determined by comparing the contaminant concentrations of discrete samples at each sample point to the applicable groundwater remediation objective. Sample points shall be determined by the program under which remediation is performed.

b) Unless the person elects to composite samples or average sampling results as provided in subsections (c) and (d) of this Section, compliance with soil remediation objectives developed under Subparts D through G and I shall be determined by comparing the contaminant concentrations of discrete samples to the applicable soil remediation objective. Compliance is achieved if each sample result does not exceed that respective remediation objective.

1) Except as provided in subsections (c) and (d) of this Section, compositing of samples is not allowed.

2) Except as provided in subsection (c) and (d) of this Section, averaging of sample results is not allowed.

3) Notwithstanding subsections (c) and (d) of this Section, compositing of samples and averaging of sample results is not allowed for the construction worker population.

4) The number of sampling points required to demonstrate compliance is determined by the requirements applicable to the program under which remediation is performed.

c) If a person chooses to composite soil samples or average soil sample results to determine compliance relative to the migration to groundwater portion of the groundwater ingestion exposure route, the following requirements apply:

1) A minimum of two sampling locations for every 0.5 acre of contaminated area is required, with discrete samples at each sample location obtained at every two feet of depth, beginning at six inches below the ground surface and continuing through the zone of contamination. Alternatively, a

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Table B: Tier 1 Soil Remediation Objectives[a] for Industrial/Commercial Properties

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
83-32-9	Acenaphthene	120,000[b]	-----[c]	120,000[b]	-----[c]	570[b]	2,900	*
67-64-1	Acetone	200,000[b]	100,000[d]	200,000[b]	100,000[d]	16[b]	16	*
15972-60-8	Alachlor[o]	72[e]	-----[c]	1,600[e]	-----[c]	0.04	0.2	NA
116-06-3	Aldicarb[o]	2,000[b]	-----[c]	200[b]	-----[c]	0.013	0.07	NA
309-00-2	Aldrin	0.3[e]	6.6[e]	6.1[b]	9.3[e]	0.5[e]	2.5	*
120-12-7	Anthracene	610,000[b]	-----[c]	610,000[b]	-----[c]	12,000[b]	59,000	*
1912-24-9	Atrazine[o]	72,000[b]	-----[c]	7,100[b]	-----[c]	0.066	0.33	NA
71-43-2	Benzene	200[e]	1.5[e]	4,300[e]	2.1[e]	0.03	0.17	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
56-55-3	Benzo(*a*)anthracene	8[e]	-----[c]	170[e]	-----[c]	2	8	*
205-99-2	Benzo(*b*)fluoranthene	8[e]	-----[c]	170[e]	-----[c]	5	25	*
207-08-9	Benzo(*k*)fluroanthene	78[e]	-----[c]	1,700[e]	-----[c]	49	250	*
50-32-8	Benzo(*a*)pyrene	0.8[e]	-----[c]	17[e]	-----[c]	8	82	*
111-44-4	Bis(2-chloroethyl)ether	5[e]	0.47[e]	75[e]	0.66[e]	0.0004[e,f]	0.0004	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	410[e]	31,000[d]	4,100[b]	31,000[d]	3,600	31,000[d]	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	92[e]	3,000[d]	2,000[e]	3,000[d]	0.6	0.6	*
75-25-2	Bromoform	720[e]	100[e]	16,000[e]	140[e]	0.8	0.8	*
71-36-3	Butanol	200,000[b]	10,000[d]	200,000[b]	10,000[d]	17[b]	17	NA
85-68-7	Butyl benzyl phthalate	410,000[b]	930[d]	410,000[b]	930[d]	930[d]	930[d]	*
86-74-8	Carbazole	290[e]	-----[c]	6,200[e]	-----[c]	0.6[e]	2.8	NA

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
1563-66-2	Carbofuran[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.22	1.1	NA
75-15-0	Carbon disulfide	200,000[b]	720[d]	20,000[b]	9.0[b]	32[b]	160	*
56-23-5	Carbon tetrachloride	44[e]	0.64[e]	410[b]	0.90[e]	0.07	0.33	*
57-74-9	Chlordane	4[e]	38[e]	12[b]	53[e]	10	48	*
106-47-8	4 - Chloroaniline (*p*-Chloroaniline)	8,200[b]	----[c]	820[b]	-----[c]	0.7[b]	0.7	1.3
108-90-7	Chlorobenzene (Monochlorobenzene)	41,000[b]	210[b]	4,100[b]	1.3[b]	1	6.5	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	41,000[b]	1,300[d]	41,000[b]	1,300[d]	0.4	0.4	*
67-66-3	Chloroform	940[e]	0.54[e]	2,000[b]	0.76[e]	0.6	2.9	*
218-01-9	Chrysene	780[e]	-----[c]	17,000[e]	-----[e]	160	800	*
94-75-7	2,4-D	20,000[b]	-----[c]	2,000[b]	-----[c]	1.5	7.7	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
75-99-0	Dalapon	61,000[b]	-----[c]	6,100[b]	-----[c]	0.85	8.5	1.2
72-54-8	DDD	24[e]	-----[c]	520[e]	-----[c]	16[e]	80	*
72-55-9	DDE	17[e]	-----[c]	370[e]	-----[c]	54[e]	270	*
50-29-3	DDT	17[e]	1,500[e]	100[b]	2,100[e]	32[e]	160	*
53-70-3	Dibenzo(*a,h*)anthracene	0.8[e]	-----[c]	17[e]	-----[c]	2	7.6	*
96-12-8	1,2-Dibromo-3-chloropropane	4[e]	17[b]	89[e]	0.11[b]	0.002	0.002	*
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.07[e]	0.32[e]	1.5[e]	0.45[e]	0.0004	0.004	0.005
84-74-2	Di-*n*-butyl phthalate	200,000[b]	2,300[d]	200,000[b]	2,300[d]	2,300[d]	2,300[d]	*
95-50-1	1,2-Dichlorobenzene (*o* - Dichlorobenzene)	180,000[b]	560[d]	18,000[b]	310[b]	17	43	*
106-46-7	1,4-Dichlorobenzene (*p* - Dichlorobenzene)	-----[c]	17,000[b]	-----[c]	340[b]	2	11	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
91-94-1	3,3'-Dichlorobenzidine	13[e]	-----[c]	280[e]	-----[c]	0.007[e,f]	0.033	1.3
75-34-3	1,1-Dichloroethane	200,000[b]	1,700[d]	200,000[b]	130[e]	23[b]	110	*
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	63[e]	0.70[e]	1,400[e]	0.99[e]	0.02	0.1	*
75-35-4	1,1-Dichloroethylene	18,000[b]	1,500[d]	1,800[b]	1,500[d]	0.06	0.3	*
156-59-2	*cis*-1,2-Dichloroethylene	20,000[b]	1,200[d]	20,000[b]	1,200[d]	0.4	1.1	*
156-60-5	*trans*-1,2-Dichloroethylene	41,000[b]	3,100[d]	41,000[b]	3,100[d]	0.7	3.4	*
78-87-5	1,2-Dichloropropane	84[e]	23[b]	1,800[e]	0.50[b]	0.03	0.15	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	33[e]	0.23[e]	610[b]	0.33[e]	0.004[e]	0.02	0.005
60-57-1	Dieldrin[n]	0.4[e]	2.2[e]	7.8[e]	3.1[e]	0.004[e]	0.02	0.0013
84-66-2	Diethyl phthalate	1,000,000[b]	2,000[d]	1,000,000[b]	2,000[d]	470[b]	470	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
105-67-9	2,4-Dimethylphenol	41,000[b]	-----[c]	41,000[b]	-----[c]	9[b]	9	*
121-14-2	2,4-Dinitrotoluene	8.4[e]	-----[c]	180[e]	-----[c]	0.0008[e,f]	0.0008	0.013
606-20-2	2,6-Dinitrotoluene	8.4[e]	-----[c]	180[e]	-----[c]	0.0007[e,f]	0.0007	0.0067
117-84-0	Di-*n*-octyl phthalate	41,000[e]	10,000[d]	4,100[b]	10,000[d]	10,000[d]	10,000[d]	*
115-29-7	Endosulfan	12,000[b]	-----[c]	1,200[b]	-----[c]	18[b]	90	*
145-73-3	Endothall[o]	41,000[c]	-----[c]	4,100[b]	-----[c]	0.4	0.4	NA
72-20-8	Endrin	610[b]	-----[c]	61[b]	-----[c]	1	5	*
100-41-4	Ethylbenzene	200,000[b]	400[d]	20,000[b]	58[b]	13	19	*
206-44-0	Fluoranthene	82,000[b]	-----[c]	82,000[b]	-----[c]	4,300[b]	21,000	*
86-73-7	Fluorene	82,000[b]	-----[c]	82,000[b]	-----[c]	560[b]	2,800	*
76-44-8	Heptachlor	1[e]	11[e]	28[e]	16[e]	23	110	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
1024-57-3	Heptachlor epoxide	0.6[e]	9.2[e]	2.7[b]	13[e]	0.7	3.3	*
118-74-1	Hexachlorobenzene	4[e]	1.8[e]	78[e]	2.6[e]	2	11	*
319-84-6	*alpha*-HCH (*alpha*-BHC)	0.9[e]	1.5[e]	20[e]	2.1[e]	0.0005[e,f]	0.003	0.002
58-89-9	*gamma*-HCH (Lindane)[n]	4[e]	-----[c]	96[e]	-----[c]	0.009	0.047	*
77-47-4	Hexachlorocyclopentadiene	14,000[b]	16[b]	14,000[b]	1.1[b]	400	2,200[d]	*
67-72-1	Hexachloroethane	2,000[b]	-----[c]	2,000[b]	-----[c]	0.5[b]	2.6	*
193-39-5	Indeno(1,2,3-*c,d*)pyrene	8[e]	-----[c]	170[e]	-----[c]	14	69	*
78-59-1	Isophorone	410,000[b]	4,600[d]	410,000[b]	4,600[d]	8[b]	8	*
72-43-5	Methoxychlor	10,000[b]	-----[c]	1,000[b]	-----[c]	160	780	*
74-83-9	Methyl bromide (Bromomethane)	2,900[b]	15[b]	1,000[b]	3.9[b]	0.2[b]	1.2	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
75-09-2	Methylene chloride (Dichloromethane)	760[e]	24[e]	12,000[b]	34[b]	0.02[e]	0.2	*
95-48-7	2-Methylphenol (*o* - Cresol)	100,000[b]	----[c]	100,000[b]	----[c]	15[b]	15	*
86-30-6	*N*-Nitrosodiphenylamine	1,200[e]	----[c]	25,000[e]	----[c]	1[e]	5.6	0.66
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.8[e]	----[c]	18[e]	----[c]	0.00005[e,f]	0.00005	0.66
91-20-3	Naphthalene	82,000[b]	----[c]	8,200[b]	----[c]	84[b]	420	*
98-95-3	Nitrobenzene	1,000[b]	140[b]	1,000[b]	9.4[b]	0.1[b,f]	0.1	0.26
108-95-2	Phenol	1,000,000[b]	----[c]	120,000[b]	----[c]	100[b]	100	*
1918-02-1	Picloram[o]	140,000[b]	----[c]	14,000[b]	----[c]	2	20	NA
1336-36-3	Polychlorinated biphenyls (PCBs)[n]	1; 10; 25[h]	----[c,h]	1[h]	----[c,h]	----[h]	----[h]	*
129-00-0	Pyrene	61,000[b]	----[c]	61,000[b]	----[c]	4,200[b]	21,000	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
122-34-9	Simazine[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.04	0.37	NA
100-42-5	Styrene	410,000[b]	1,500[d]	41,000[b]	430[b]	4	18	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	110[e]	20[e]	2,400[e]	28[e]	0.06	0.3	*
108-88-3	Toluene	410,000[b]	650[d]	410,000[b]	42[b]	12	29	*
8001-35-2	Toxaphene[n]	5.2[e]	170[e]	110[e]	240[e]	31	150	*
120-82-1	1,2,4-Trichlorobenzene	20,000[b]	3,200[d]	2,000[b]	920[b]	5	53	*
71-55-6	1,1,1-Trichloroethane	-----[c]	1,200[d]	-----[c]	1,200[d]	2	9.6	*
79-00-5	1,1,2-Trichloroethane	8,200[b]	1,800[d]	8,200[b]	1,800[d]	0.02	0.3	*
79-01-6	Trichloroethylene	520[e]	8.9[e]	1,200[b]	12[e]	0.06	0.3	*
108-05-4	Vinyl acetate	1,000,000[b]	1,600[b]	200,000[b]	10[b]	170[b]	170	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
75-01-4	Vinyl chloride	3[e]	0.06[e]	65[e]	0.08[e]	0.01[f]	0.07	*
108-38-3	m-Xylene	1,000,000	420[d]	410,000[b]	420[d]	210	210	*
95-47-6	o-Xylene	1,000,000	410[d]	410,000[b]	410[d]	190	190	*
106-42-3	p-Xylene	1,000,000	460[d]	410,000[b]	460[d]	200	200	*
1330-20-7	Xylenes (total)	1,000,000[b]	410[d]	410,000[b]	410[d]	150	150	*
	Ionizable Organics							
65-85-0	Benzoic Acid	1,000,000[b]	-----[c]	820,000[b]	-----[c]	400[b,i]	400[i]	*
95-57-8	2-Chlorophenol	10,000[b]	53,000[d]	10,000[b]	53,000[d]	4[b,i]	20[i]	*
120-83-2	2,4-Dichlorophenol	6,100[b]	-----[c]	610[b]	-----[c]	1[b,i]	1[i]	*
51-28-5	2,4-Dinitrophenol	4,100[b]	-----[c]	410[b]	-----[c]	0.2[b,f,i]	0.2[i]	3.3
88-85-7	Dinoseb[o]	2,000[b]	-----[c]	200[b]	-----[c]	0.34[b,i]	3.4[i]	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
87-86-5	Pentachlorophenol	24[e,j]	-----[c]	520[e,j]	-----[c]	0.03[f,i]	0.14[i]	2.4
93-72-1	2,4,5-TP (Silvex)	16,000[b]	-----[c]	1,600[b]	-----[c]	11[i]	55[i]	*
95-95-4	2,4,5-Trichlorophenol	200,000[b]	-----[c]	200,000[b]	-----[c]	270[b,i]	1,400[i]	*
88-06-2	2,4,6 Trichlorophenol	520[e]	390[e]	11,000[e]	540[e]	0.2[e,f,i]	0.77[i]	0.43

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	
	Inorganics							
7440-36-0	Antimony	820[b]	-----[c]	82[b]	-----[c]	0.006[m]	0.024[m]	*
7440-38-2	Arsenic[l,n]	3[e,t]	1,200[e]	61[b]	25,000[e]	0.05[m]	0.2[m]	
7440-39-3	Barium	140,000[b]	910,000[b]	14,000[b]	870,000[b]	2.0[m]	2.0[m]	*
7440-41-7	Beryllium	1[e,t]	2,100[e]	29[e]	44,000[e]	0.004[m]	0.5[m]	*
7440-42-8	Boron	180,000[b]	1,000,000	18,000[b]	1,000,000	2.0[m]	2.0[m]	*
7440-43-9	Cadmium[l,n]	2,000[b,r]	2,800[e]	200[b,r]	59,000[e]	0.005[m]	0.05[m]	*
16887-00-6	Chloride	--------[c]	-----[c]	-----[c]	-----[c]	200[m]	200[m]	*
7440-47-3	Chromium, total	10,000[b]	420[e]	4,100[b]	8,800[e]	0.1[m]	1.0[m]	*
16065-83-1	Chromium, ion, trivalent	1,000,000[b]	-----[c]	330,000[b]	-----[c]	-----[g]	-----[g]	*
18540-29-9	Chromium, ion, hexavalent	10,000[b]	420[e]	4,100[b]	8,800[e]	-----	-----	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	
7440-48-4	Cobalt	120,000[b]	-----[c]	12,000[b]	-----[c]	1.0[m]	1.0[m]	*
7440-50-8	Copper[n]	82,000[b]	-----[c]	8,200[b]	-----[c]	0.65[m]	0.65[m]	*
57-12-5	Cyanide (amenable)	41,000[b]	-----[c]	4,100[b]	-----[c]	0.2[q]	0.6[q]	*
7782-41-4	Fluoride	120,000[b]	-----[c]	12,000[b]	-----[c]	4.0[m]	4.0[m]	*
15438-31-0	Iron	-----[c]	-----[c]	-----[c]	-----[c]	5.0[m]	5.0[m]	*
7439-92-1	Lead	400[k]	-----[c]	400[k]	-----[c]	0.0075[m]	0.1[m]	*
7439-96-5	Manganese	96,000[b]	91,000[b]	9,600[b]	8,700[b]	0.15[m]	10.0[m]	*
7439-97-6	Mercury[l,n]	610[b]	540,000[b]	61[b,s]	52,000[b]	0.002[m]	0.01[m]	*
7440-02-0	Nickel[l]	41,000[b]	21,000[e]	4,100[b]	440,000[e]	0.1[m]	2.0[m]	*
14797-55-8	Nitrate as N[p]	1,000,000[b]	-----[c]	330,000[b]	-----[c]	10.0[q]	100[q]	*
7782-49-2	Selenium[l,n]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.05[m]	0.05[m]	*

		Exposure Route-Specific Values for Soils				Migration to Groundwater Portion of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	
7440-22-4	Silver	10,000[b]	-----[c]	1,000[b]	-----[c]	0.05[m]	-----	*
14808-79-8	Sulfate	-----[c]	-----[c]	-----[c]	-----[c]	400[m]	400[m]	*
7440-28-0	Thallium	160[b,u]	-----[c]	160[b,u]	-----[c]	0.002[m]	0.02[m]	*
7440-62-2	Vanadium	14,000[b]	-----[c]	1,400[b]	-----[c]	0.049[m]	-----	*
7440-66-6	Zinc[l]	610,000[b]	-----[c]	61,000[b]	-----[c]	5.0[m]	10[m]	*

"*" indicates that the ADL is less than or equal to the specified cleanup objective.

NA means Not Available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Cleanup Objective Notations (2nd, 5th thru 8th Columns)

a Soil cleanup objectives based on human health criteria only.
b Calculated values correspond to a target hazard quotient of 1.
c No toxicity criteria available for this route of exposure.
d Soil saturation concentration (C_{sat}) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.
e Calculated values correspond to a cancer risk level of 1 in 1,000,000. ~~Site-specific conditions may warrant use of a greater risk level but not to exceed 1 in 10,000.~~
f *Level is at or below Contract Laboratory Program required quantitation limit for Regular Analytical Services (RAS).*
g Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.
h A preliminary goal of 1 ppm has been set for PCBs based on *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, EPA/540G-90/007, and on USEPA efforts to manage PCB contamination. See 40 CFR 761.120 for USEPA "PCB Spill Cleanup Policy." This regulation goes on to say that the cleanup goal for an unrestricted area is 10 ppm and 25 ppm for a restricted area, provided both have at least 10 inches of clean cover.
ii Soil cleanup objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D in this Part.
j Ingestion soil cleanup objective adjusted by a factor of 0.5 to account for dermal route.
k A preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.
l Potential for soil-plant-human exposure.
m Concentration in mg/L determined by the Toxicity Characteristic Leaching Procedure (TCLP). The person conducting the remediation has the option to use TCLP cleanup objectives listed in this Table or the applicable pH-specific soil cleanup objectives in Appendix B, Tables C or D of this Part. If the person wishes to calculate cleanup objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.
n The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.
o For agrichemical facilities, cleanup objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.
p For agrichemical facilities, soil cleanup objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the located in Subparts D and I of this Part.
q The TCLP extraction must be done using water at a pH of 7.0.
r Value based on dietary Reference Dose.
s Value based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7).
t Note that Table value is likely to be less than background concentration for this chemical; screening or remediation concentrations using the procedures of Subpart D of this Part.
u Value based on Reference Dose for thallium sulfate (CAS No. 7446-18-6)